THE GENUS APHIDOLETES KIEFFER (DIPTERA: CECIDOMYIIDAE) IN NORTH AMERICA[1]

Raymond J. Gagné[2]

USDA[1]

Larvae of *Aphidoletes* species prey upon aphidoids and are thus of beneficial economic importance. European workers, interested in the biology of this group are concerned about the taxonomic status of the Nearctic species. After a study of the 13 species of *Aphidoletes* described from North America, I find that only 3 valid species occur here: *A. aphidimyza* (Rondani), *A. thompsoni* Möhn, and *A. urticariae* (Kieffer). All 3 occur in the Palearctic region and *aphidimyza* occurs also in Hawaii and South America. *"Cecidomyia" cucumeris* Lintner (1888) is here considered a nomen dubium though it could be referred to the Aphididae (Homoptera). It was originally described solely on the basis of a melon shoot deformity in which the smaller leaves had been transformed into irregular, subovate, downy galls. The damage was possibly due to *Aphis gossypii* Glover and is similar to that ascribed to this species in Metcalf, Flint, and Metcalf (1962). The adult cecidomyiids Lintner reared from and thought were responsible for the damage are in the U. S. National Museum and belong to *A. aphidimyza*. The galls on which the name *cucumeris* was based are presumably lost; the type locality is Lowell, Mass. I wish to thank John Wilcox of the New York State Museum in Albany for the loan of the Felt Collection.

[1]Accepted for publication: May 28, 1971 [3.0115].

[2]Systematic Entomology Laboratory, Agriculture Research Service, USDA, c/o U. S. National Museum, Washington, DC 20560.

Key to adult males of Nearctic Aphidoletes

1. All claws toothed; antennal flagellomeres each with a very elongated loop on the basal circumfilum only ..... **A. thompsoni**
   Hind claws simple; antennal flagellomeres each with a very elongated loop on the basal and distal circumfila 2
2. Male sternum X not recurved and not papillose; aedeagus widest at about midlength ..... **A. aphidimyza**
   Male sternum X recurved, caudalmost surface (actually mesoventral area) with several papillae; aedeagus widest at about one-third the distance from apex ..... **A. urticariae**

Aphidoletes aphidimyza (Rondani)

aphidimyza Rondani 1847: 443 (Cecidomya [sic]). Types not seen.

cucumeris Lintner 1897: 165, pl. 2, figs. 1-7 (*Diplosis;* misidentification).

rosivora Coquillett 1900: 46 (*Diplosis*). New synonymy. Lectotype here designated, male, Washington, D. C., reared IX-15-1891 from larvae under sepals of rose, A. B. Cordley, deposited in U.S.N.M. Paralectotype, ♀, same data as lectotype.

hamamelidis Felt 1907: 29 (Bremia). NEW SYNONYMY. Holotype, male, in Felt Collection.

basalis Felt 1908: 397. NEW SYNONYMY. Holotype, male, in Felt Collection.

borealis Felt 1908: 397. NEW SYNONYMY. Lectotype here designated, male. Albany, N. Y., reared VIII-7-1907 from leaves of tulip tree, a1160, deposited in Felt Collection. Paralectotype, female, same data as lectotype.

flavida Felt 1908: 397. NEW SYNONYMY. Holotype, male, in Felt Collection.

fulva Felt 1908: 397. NEW SYNONYMY. Holotype, male, in Felt Collection.

marginata Felt 1908: 397. NEW SYNONYMY. Holotype, male, in Felt Collection.

marina Felt 1908: 397. NEW SYNONYMY. Holotype, male, in Felt Collection.

meridionalis Felt 1908: 397. NEW SYNONYMY. Holotype, male, in U.S.N.M.

doutti Pritchard 1961: 100 (*Phaenobremia*). NEW SYNONYMY. Holotype, male, and paratypes in U.S.N.M.

This species is the commonest *Aphidoletes* in North America and

occurs at least from Nova Scotia to Washington, south to Virginia and California. It has been recorded throughout Europe and from Egypt, Japan, and Hawaii. In addition I recently saw specimens from La Cruz, Chile, that were associated with the aphid, *Capitophorus eleagni* Del Guercio. *A. aphidimyza* has been recorded as a predator of a great number of aphid species (Nijveldt 1969). Felt described it under 8 different names (Felt 1907, 1908). Differences among his species of *Aphidoletes* were based almost entirely on the length of leg segments relative to one another, but these were not measured exactly. When the legs are measured under a microscope with an ocular micrometer, those differences either do not obtain or are due to normal variation. At any rate, the male genitalia are identical to one another and to those of European specimens of *aphidimyza* that I have seen. A diagnosis and illustrations of this species are given in Harris (1966). Adults are distinguished from *thompsoni* by the simple hind claws and from *urticariae* by the unrecurved, apapillose sternum X of the male genitalia. There are no apparent differences between females of *aphidimyza* and *urticariae*.

Aphidoletes thompsoni Möhn

thompsoni Möhn 1954: 462, figs. 1-7A.

A. thompsoni is a predator of *Adelges piceae* (Ratz.) and *A. nüsslini* (C.B.) (Homoptera: Adelgidae). Known originally from central Europe, it was introduced in recent years to eastern and western Canada, northeastern United States, North Carolina, and the Pacific Northwest for the control of *A. piceae*. It has definitely become established in the Pacific Northwest (Mitchell & Wright 1967). *A. thompsoni* is closely related to the European *Aphidoletes abietis* (Kieffer), a predator of *Adelges abietis* (Ratz.), but can be separated by larval characters (Möhn 1954). Adults of *A. thompsoni* can be separated from the other 2 Nearctic species by the toothed hind claws and, in the male, by the presence of irregular loops on the basal circumfilum only. The male genitalia resemble those of *A. abietis* illustrated in Harris (1966).

Aphidoletes urticariae (Kieffer)

urticariae Kieffer 1895: 9 (*Bremia*). Types not seen; presumably lost.

recurvata Felt 1908: 397. NEW SYNONYMY. Holotype, male, in Felt Collection.

A. urticariae, though quite common in Europe and with a very wide host range (Nijveldt 1969), is known in the Nearctic area only from the holotype of *recurvata* and a series of 4 males caught at Keene Valley, N. Y. As with *A. aphidimyza*, the hind claw is simple but, unlike that species, the male sternum X is recurved and its caudalmost surface (actually the mesoventral area) is papillose. A diagnosis and an illustration of the male genitalia are given in Harris (1966). As with most Kieffer types, those of *urticariae* are presumed lost. The identity of this species in Harris (1966), Nijveldt (1969), and this paper, follows the use of Nijveldt (1952), who so identified specimens found in association with the type host, *Aphis urtica* Gmelin on *Urtica dioica* L. Two considerations, however, cast doubt on that identification. One is that the sympatric *aphidimyza* also occurs in nature on that host aphid and plant. The second consideration is that there are in the Felt Collection 4 male specimens of *aphidimyza* labelled, "*Aphidoletes urticariae*, from J. J. Kieffer." Those specimens are not necessarily from the original type series and could have been a subsequent misidentification by Kieffer; but because Kieffer never described more than the male antenna of *urticariae*, which is similar to *aphidimyza*, we cannot be certain which species he described. Inasmuch as a great amount of biological work has been done since Nijveldt (1952) on *urticariae* Kieffer of Nijveldt and authors, there would be a definite advantage to fixing the recent use of *urticariae* by the designation of a neotype.

Literature cited

Coquillett, D. W. 1900. Two new cecidomyians destructive to buds of roses. United States Dep. Agr. Div. Entomol. Bull. (n. ser.) 22: 44-48.

Felt, E. P. 1907. New Species of Cecidomyiidae. 53 pp. Albany, N. Y.

———. 1908. Appendix D. New York State Mus. Bull. 134: 286-422.

Harris, K. M. 1966. Gall midge genera of economic importance (Diptera: Cecidomyiidae). Part I: Introduction and subfamily Cecidomyiinae; supertribe Cecidomyiidi. Trans. Roy. Entomol. Soc. London. 118: 313-358.

Kieffer, J. J. 1895. Observations sur les ornements des antennes des cécidomyies. Feuille Jeunes Nat. 26: 7-10.

Lintner, J. A. 1888. The melon plant louse. Cult. & Country Gent. 53: 725.

———. 1897. Reports on the Injurious and Other Insects of the State of New York. Report 11 (for 1895), 85-326. Albany, N. Y., "1896".

Metcalf, C. L., W. P. Flint, and R. L. Metcalf. 1962. Destructive and Useful Insects. Fourth Ed. McGraw Hill. New York. 1087 pp.

Mitchell, R. G. and K. H. Wright. 1967. Foreign predators for control of the balsam woolly aphid in the Pacific Northwest. J. Econ. Ent. 60: 140-147.

Möhn, E. 1954. Eine neue zoophage Gallmücken-Art an Tannenläusen. Z. Angew. Ent. 36: 462-468.

Nijveldt, W. 1952. Over de levenswijze van *Phaenobremia urticariae* Kffr. (Diptera, Itonididae) f. n. sp. Ent. Ber. 14: 8-13, 23-29.

———. 1969. Gall Midges of Economic Importance. Vol. VIII. Gall Midges—Miscellaneous. 221 pp. Crosby, Lockwood & Son, Ltd. London.

Pritchard, A. E. 1961. *Phaenobremia doutti*, a new gall midge predator of aphids in California (Diptera: Cecidomyiidae). Ent. Soc. Washington Proc. 63: 100-101.

Rondani, C. 1847. Osservazioni sopra parecchie specie di Esapodi Afidici di e sui loronemici. Nuovi Ann. Sci. Natur. Bologna (2) 8: 337-351, 432-448.

2.0115. The genus Aphidoletes Kieffer (Diptera: Cecidomyiidae in North America.

Abstract.—New specific synonymy is established for North American *Aphidoletes* (Diptera: Cecidomyiidae), and notes on distribution and taxonomic separation are given for each of the 3 valid Nearctic species: *A. aphidimyza* (Rondani), *A. thompsoni* Möhn, and *A. urticariae* (Kieffer). New synonyms of *aphidimyza* are: *Diplosis rosivora* Coquillett, *Bremia hamamelidis* Felt, *Aphidoletes basalis* Felt, *Aphidoletes borealis* Felt, *Aphidoletes flavida* Felt, *Aphidoletes fulva* Felt, *Aphidoletes marginata* Felt, *Aphidoletes marina* Felt, *Aphidoletes meridionalis* Felt, and *Phaenobremia doutti* Pritchard; a new synonym of *urticariae* is *Aphidoletes recurvata* Felt. *Cecidomyia cucumeris* (Lintner) is here considered a *nomen dubium*.—Raymond J. Gagné, *c/o U. S. National Museum, Washington, DC 20560.*

Descriptors: Diptera; Cecidomyiidae; *Aphidoletes*, North America; key to species; new synonymy.